LEAN PREMIXED COMBUSTION IN A PILOTED PREMIXED JET BURNER

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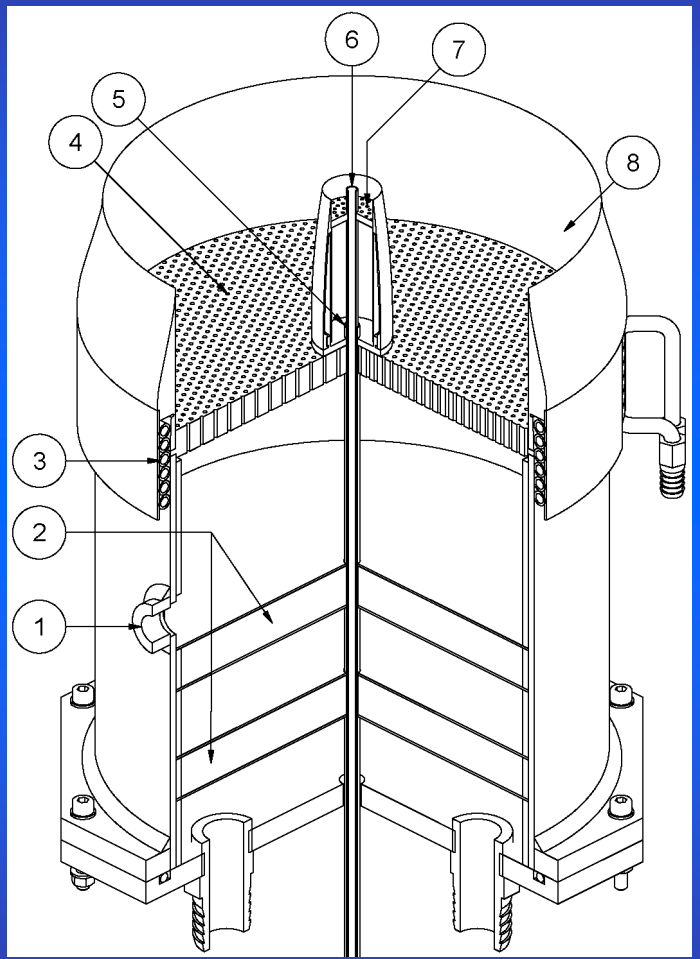
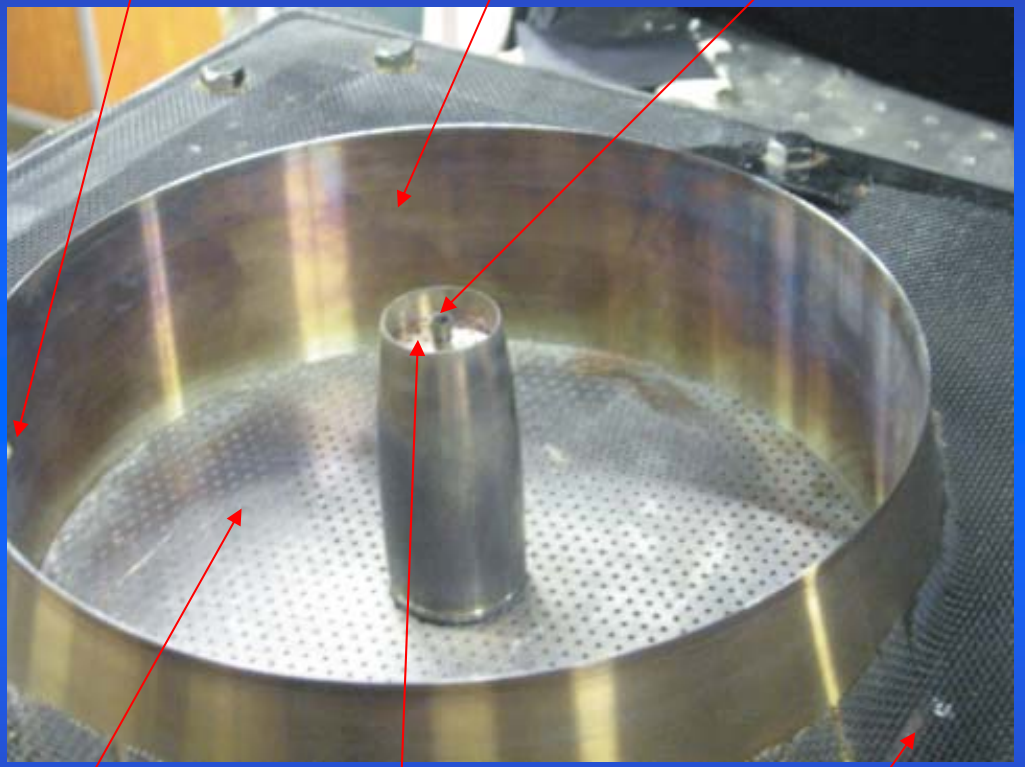
Burner Overview



Coflow Non-Premixed Pilot Flame

Coflow Curtain 198mm ID

Central Jet 4mm ID

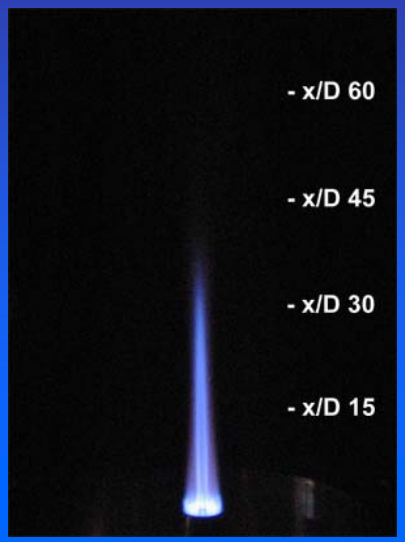


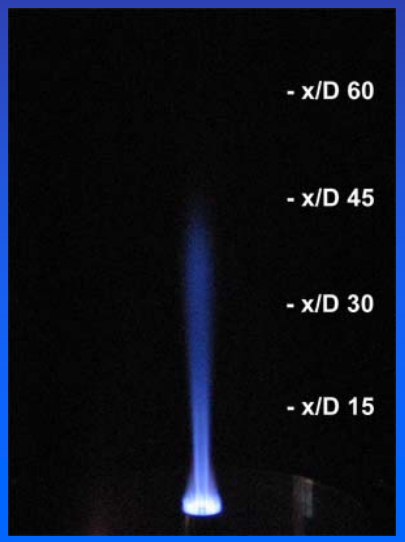
Perforated Coflow Base Plate

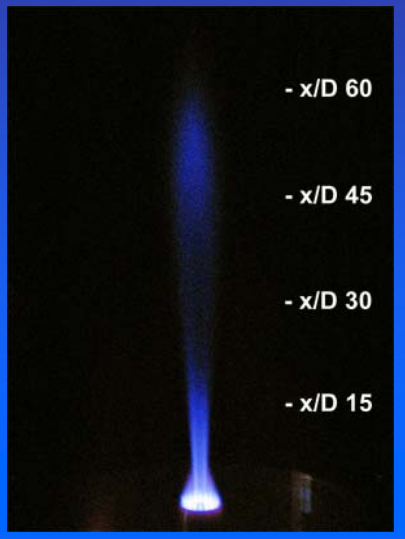
Pilot (Annulus) Flame Holder

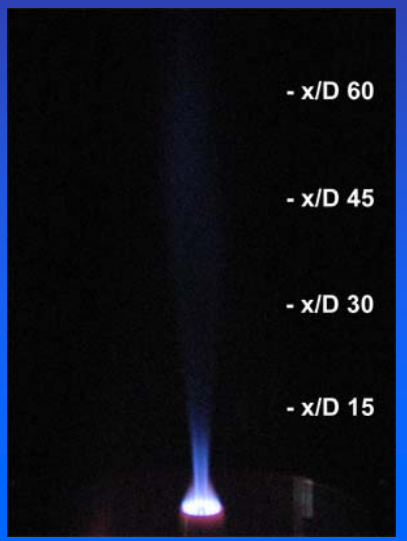
Cooling Coils

Flames for Further Study









Transition for central jet velocities 50, 100, 150 and 200m/s

(Re~=12000, 24000, 36000 and 48000), Tcoflow=1500K

2D Temperature-X_{OH} imaging and LDV has already been completed for these flames, in progress for Φ=0.6 and 0.8 flames

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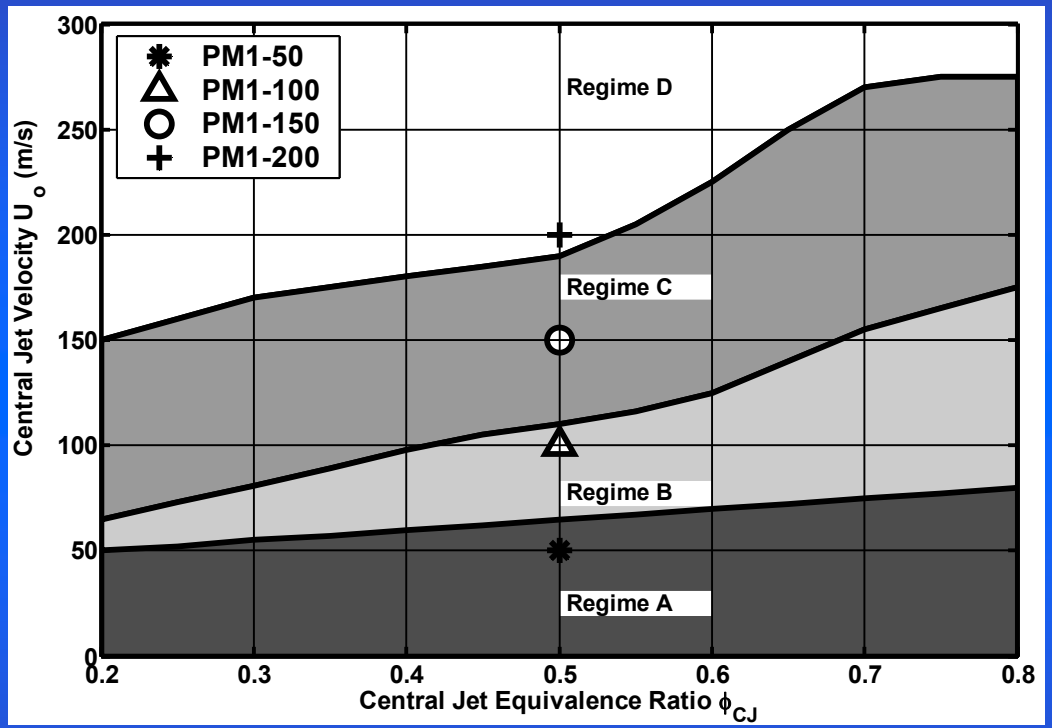
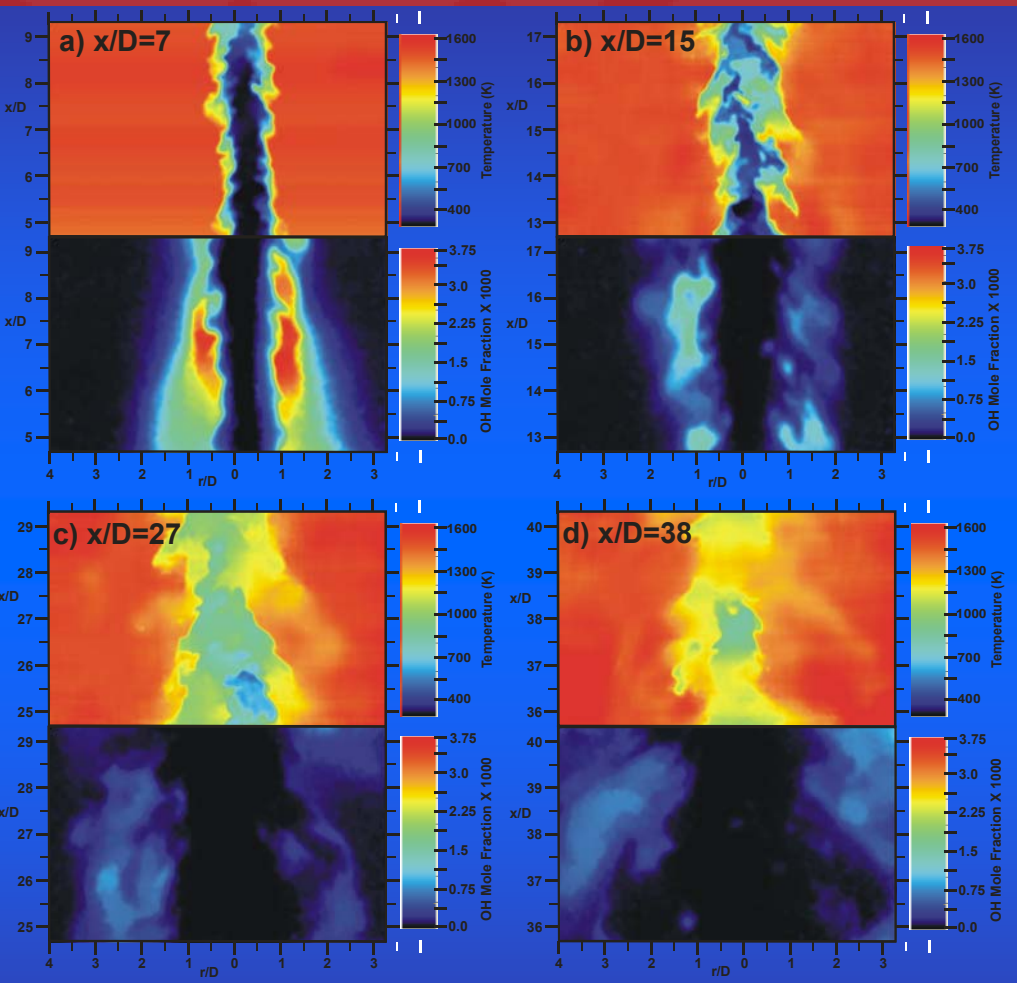
Stability Diagram

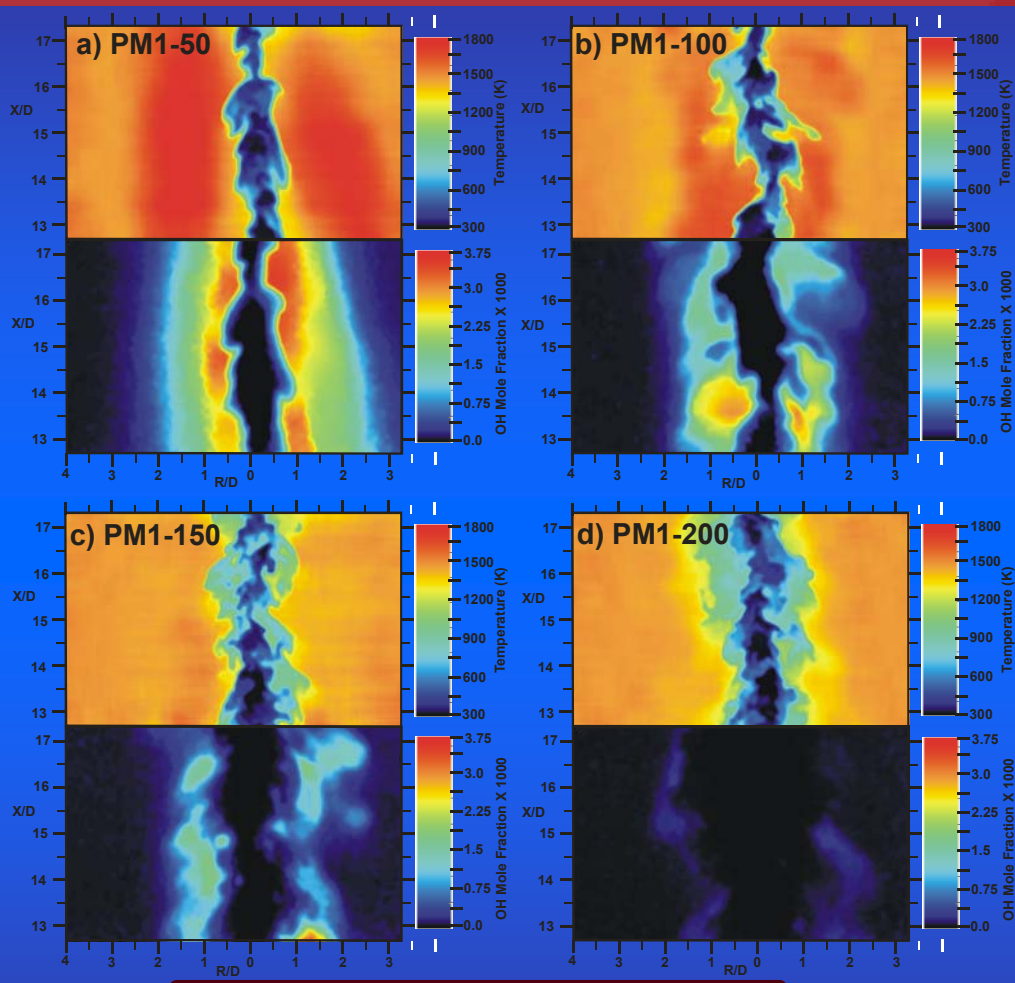


- Selected flames (PM1-xx) to investigate extinction re-ignition transition behavior

Extinction by Shear – Temperature-X_{OH} Results



Flame PM1-150



Flame PM1- 50 to 200 @ X/D=15

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Future directions

- Extinction re-ignition in model flames has proven to be powerful paradigm to test non-premixed turbulence chemistry interaction models
- Burner displays characteristics that will be useful to further investigate turbulence-chemistry interactions in premixed combustion.
- Possibility of being target premixed flame for TNF
- Further experimental and numerical studies